

CLAIMS

1. A method for manufacturing a mask blank comprising the actions of:
 - providing a substrate;
 - forming a masking layer on said substrate;
 - forming at least one layer of material on said substrate such that a reflectivity of a writing wavelength back into a film sensitive to the writing wavelength is below 4 %.
2. The method according to claim 1, wherein said reflectivity is below 2%.
3. The method according to claim 1, wherein said reflectivity is below 1%.
4. The method according to claim 1, wherein said reflectivity is below 0.5 %.
5. The method according to claim 1, wherein a silicon compound is facing the film sensitive to the writing wavelength.
6. The method according to claim 1, wherein a layer of silicon dioxide is facing the film sensitive to the writing wavelength.
7. The method according to claim 1, wherein the masking material comprises silicon.
8. The method according to claim 1, wherein said film sensitive to the writing wavelength is less than 300 nm thick.
9. The method according to claim 1, wherein said film sensitive to the writing wavelength is less than 200 nm thick.
10. The method according to claim 1, wherein said at least one layer of material comprises oxynitride.
11. The method according to claim 1, further comprising the action of:

- exposing at least a portion of said film sensitive to the writing wavelength with a writing wavelength,
- etching the exposed mask blank in a gas mixture comprising chlorine.

12. The method according to claim 1, further comprising the action of:

- exposing at least a portion of said film sensitive to the writing wavelength with a writing wavelength,
- etching the exposed mask blank in a gas mixture comprising fluorine.

13. The method according to claim 12, wherein the film sensitive to the writing wavelength is having low activation energy.

14. The method according to claim 1, wherein the film sensitive to the writing wavelength is a chemically amplified resist (CAR).

15. The method according to claim 1, further comprising the actions of:

- Exposing at least a portion of said film sensitive to the writing wavelength with a writing wavelength,
- stopping the reaction in said film sensitive to the writing wavelength by exposure to a base.

16. The method according to claim 12 or 15, further comprising the action of;

- slowing down a reaction caused by exposure by having an ambient gas of low humidity.

17. The method according to claim 1, further comprising the action of;

- forming a film of adhesive promoter.

18. A method for manufacturing a mask blank comprising the actions of:

- providing a substrate;
- forming a masking layer on said substrate;

- forming at least one layer of material on said substrate such that a surface facing a film sensitive to a writing wavelength is chemically inert.

19. The method according to claim 18, wherein a reflectivity of said writing wavelength back into said film sensitive to the writing wavelength is below 4 %.

20. The method according to claim 18, wherein said reflectivity is below 2 %.

21. The method according to claim 18, wherein said reflectivity is below 1 %.

22. The method according to claim 18, wherein said reflectivity is below 0.5 %.

23. The method according to claim 18, wherein a silicon compound is facing the film sensitive to the writing wavelength.

24. The method according to claim 18, wherein a layer of silicon dioxide is facing the film sensitive to the writing wavelength.

25. The method according to claim 18, wherein the masking material comprises silicon.

26. The method according to claim 18, wherein said film sensitive to the writing wavelength is less than 300 nm thick.

27. The method according to claim 18, wherein said film sensitive to the writing wavelength is less than 200 nm thick.

28. The method according to claim 18, wherein at least one layer of material comprises oxynitride.

29. The method according to claim 18, further comprising the action of:

- Exposing at least a portion of said film sensitive to the writing wavelength with a writing wavelength,
- etching the exposed mask blank in a gas mixture comprising chlorine.

30. The method according to claim 18, further comprising the action of:

- exposing at least a portion of said film sensitive to the writing wavelength with a writing wavelength,
- etching the exposed mask blank in a gas mixture comprising fluorine.

31. The method according to claim 29, wherein the film sensitive to the writing wavelength is having low activation energy.

32. The method according to claim 18, wherein the film sensitive to the writing wavelength is a chemically amplified resist (CAR).

33. The method according to claim 32, further comprising the actions of:

- exposing at least a portion of said film sensitive to the writing wavelength with a writing wavelength,
- stopping the reaction in said film sensitive to the writing wavelength by exposure to a base.

34. The method according to claim 29 or 32, further comprising the action of;

- slowing down a reaction caused by exposure by having an ambient gas of low humidity.

35. A mask blank comprising

- a substrate;
- a masking layer on said substrate;
- at least one layer of material on said substrate such that a reflectivity of a writing wavelength back into a film sensitive to the writing wavelength is below 4 %.

36. The mask blank according to claim 35, wherein said reflectivity is below 2%.

37. The mask blank according to claim 35, wherein said reflectivity is below 1%.

38. The mask blank according to claim 35, wherein said reflectivity is below 0.5 %.

39. The mask blank according to claim 35, wherein a silicon compound is facing the film sensitive to the writing wavelength.
40. The mask blank according to claim 35, wherein a layer of silicon dioxide is facing the film sensitive to the writing wavelength.
41. The mask blank according to claim 35, wherein the masking material comprises silicon.
42. The mask blank according to claim 35, wherein said film sensitive to the writing wavelength is less than 300 nm thick.
43. The mask blank according to claim 35, wherein said film sensitive to the writing wavelength is less than 200 nm thick.
44. The mask blank according to claim 35, wherein said at least one layer of material comprises oxynitride
45. The mask blank according to claim 35, wherein the film sensitive to the writing wavelength is having low activation energy.
46. The mask blank according to claim 35, wherein the film sensitive to the writing wavelength is a chemically amplified resist (CAR).
47. The mask blank according to claim 35, further comprising;
- a film of adhesive promoter.
48. A mask blank comprising
- a substrate;
 - a masking layer on said substrate;
 - at least one layer of material on said substrate such that a surface facing a film sensitive to a writing wavelength is chemically inert.

49. The mask blank according to claim 48, wherein a reflectivity of said writing wavelength back into said film sensitive to the writing wavelength is below 4%.
50. The mask blank according to claim 48, wherein said reflectivity is below 2%.
51. The mask blank according to claim 48, wherein said reflectivity is below 1%.
52. The mask blank according to claim 48, wherein said reflectivity is below 0.5 %.
53. The mask blank according to claim 48, wherein a silicon compound is facing the film sensitive to the writing wavelength.
54. The mask blank according to claim 48, wherein a layer of silicon dioxide is facing the film sensitive to the writing wavelength.
55. The mask blank according to claim 48, wherein the masking material comprises silicon.
56. The mask blank according to claim 48, wherein said film sensitive to the writing wavelength is less than 300 nm thick.
57. The mask blank according to claim 48, wherein said film sensitive to the writing wavelength is less than 200 nm thick.
58. The mask blank according to claim 48, wherein said at least one layer of material comprises oxynitride
59. The mask blank according to claim 48, wherein the film sensitive to the writing wavelength is having low activation energy.
60. The mask blank according to claim 48, wherein the film sensitive to the writing wavelength is a chemically amplified resist (CAR).
61. The mask blank according to claim 48, further comprising;
a film of adhesive promoter.